Peripheral Venous Access and Maintenance in Adults Policy and Procedure

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1.0 Purpose

To provide evidence-based guidance on the initiation, care, and maintenance of a peripheral venous access device [peripheral intravenous(IV)] in the adult.

2.0 Scope

Nurses, Medical Radiation Technologists, Anesthesia Assistants, and credentialed staff.

3.0 Policy

3.1 Staff initiating peripheral IV venous access and maintaining IV infusions are accountable for ensuring their competency.

3.2 A provider order or medical directive (Medical Directive for Intravenous Insertion, Access, and Discontinuation of Therapy) is required for the initiation or discontinuation of a peripheral IV or it may specify the conditions for the nurse to decide when to stop therapy (e.g. discontinue when patient is drinking well). Removal of a malfunctioning IV or re-siting an IV does not require an additional order.

3.3 RNs and RPNs have the authority to initiate venipuncture to establish a peripheral venous access and maintain patency (0.9% NaCl) only when a client requires medical attention and delaying venipuncture is likely to be harmful.

3.4 Vessel health and preservation are prioritized during site selection. Site selection for the initiation of a peripheral IV should start with the larger veins in the non-dominant forearm, then the dorsal portion of the hand avoiding the thumb with the last choice being the antecubital area. See Appendix A for Peripheral Intravenous Catheter Poster: Site Selection

3.5 Avoid inserting peripheral intravenous catheters in the following:

- 3.5.1 Area of flexion (e.g., wrist, ACF), except in trauma/emergency situation to avoid nerve damage and depletion of antecubital veins
- 3.5.2 Chest wall, digits, or breast
- 3.5.3 Lower legs, except in non-walking child
- 3.5.4 Insertion area that is painful on palpation or with vein that is obviously compromised (e.g., thrombosis, redness, cellulitis, cording, bruising, infiltration, phlebitis, engorgement)
- 3.5.5 In the arm of a dialysis patient containing a shunt/fistula or on the same side as a dialysis central line
- 3.5.6 On the same side as a PICC line

3.5.7 On the same side in an upper extremity when a patient has undergone surgery with axillary node dissection
3.5.8 In a patient with a hemiplegic/hemi paretic arm
3.5.9 Into any area after extravasation for subsequent VAD insertion until symptoms are resolved.

3.6 Principles of Standard-Aseptic Non Touch Technique (ANTT®) or Surgical-ANTT® must be maintained throughout all IV therapy procedures, including initiation of a peripheral venous access device, dressing application, preparing and discontinuing an IV system. This includes no touching or palpating the insertion site after skin antisepsis. If re-palpation of the vein is required after skin antisepsis, use sterile gloves for palpation and insertion.

3.7 Use vein visualization technology for patients with difficult venous access.

3.8 There shall be no more than 2 attempts per clinician at peripheral intravenous catheter insertions. After 2 unsuccessful attempts seek assistance from another clinician with a higher skill level. After 4 unsuccessful attempts, consult with the Vascular Access Team or notify the most responsible provider to determine a plan of care.

3.9 Remove and/or re-site VAD within 24-48 hours if it was inserted using non-aseptic conditions.

3.10 An adult patient with a peripheral IV will have it removed when it is no longer needed, at the first sign of malfunction or local site complications. A peripheral IV catheter is changed only if there is a clinical indication to do so and not based solely on length of dwell time.

3.11 Daily assessment and documentation of the clinical need for peripheral IV access, the entire infusion system from the IV insertion site to the solution container, (see procedure 5.1 for details) and patency is required.

3.12 A sterile Transparent Semi-Permeable membrane (TSM) dressing must be applied over the peripheral IV site and clearly labeled with date, time, and initials of initiator of the peripheral IV.

3.13 The TSM dressing must be changed every 7 days, upon suspected contamination, or immediately if dressing integrity is disrupted. If a sterile gauze dressing is used or if gauze is under the TSM dressing it must be changed every 2 days.

3.14 Infusion pumps must be used when infusing fluids in the following situations: critical fluid balance, high alert drugs, TPN, and all central lines.

3.15 The parenteral drug monograph must be followed for administering medication via the IV route. This includes indications for use, appropriate dosage and diluents, administration guidelines, monitoring parameters, side effects, incompatibilities, stability, storage requirements and potential complications of medications administered.

3.16 Accurate fluid balance is required for any patient with an IV and must be documented on the IV flow sheet in Meditech Expanse at a minimum of at the end of a shift. See Patients Standards of Care Policy and Procedure.

3.17 All IV fluid administration sets must be prepared as close to administration time as possible. IV tubing that is primed with a sterile solution with or without medications or additives must be discarded after one hour if not used within that time.

3.18 IV fluid administration sets must be labeled with the date and time when IV infusion is started.

3.19 IV lines cannot be changed from peripheral line to central line. If the patient has a new central line, a new IV line set up is required.

3.20 When IV administration sets are used intermittently, a new, sterile luer lock should be used each time to cap off the administration tubing when disconnected from the patient.

4.0 Intravenous Initiation Procedure

4.1 Before initiating a peripheral IV, consideration shall be given to the most appropriate type of access for the patient, including:

a. Age of patient
b. Condition of veins
c. Medical or surgical intervention
d. Selecting the smallest gauge and shortest length that will accommodate prescribed therapy

At least two-thirds of the IV should reside within the vessel to reduce the risk of IV failure Recommended smallest gauge and shortest length to meet patient's needs/therapy needs as follows:		
BD Nexiva	BD Insyte™ Autoguard™	Use
18g	16g & 18g	Trauma, critical care, surgery, labouring patients, rapid IV fluid/ blood product transfusions, therapeutic phlebotomy, CT procedures
20g	20g	Most adult needs: general continuous and/or intermittent infusions, therapeutic phlebotomy, CT procedures
22g	22g	Most adult needs: general continuous and/or intermittent infusions, CT procedures (when fenestration catheter available)
24g	24g	General continuous and/or intermittent infusions, older adults,
20g-22g	20g-22g	Routine transfusion of Red Blood Cells
Administration of Plasma Proteins any size IV gauge is adequate		

4.2 Pain management options shall be reviewed for patients on an individual basis. If a topical anesthetic is used, allow sufficient time for it to take effect.

4.3 Keep the patient warm and relaxed; both excessive cold and anxiety stimulate the sympathetic nervous system and can cause vasoconstriction of superficial vessels, thus making IV venipuncture more difficult.

4.4 Excessive hair around the IV catheter site may be cut or clipped to ease venipuncture and improve dressing adherence. Do not shave hair because of increased the risk of infection.

4.5 Collect supplies for the venipuncture including:

a. Non-sterile gloves
b. Appropriate IV catheter for patient
c. 2% chlorhexidine /70% alcohol swab
d. Tourniquet
e. Sterile Transparent Semi-Permeable Membrane (TSM) dressing

4.6 Follow Hand Hygiene and Glove use Policy and Procedure

4.7 Select the location for the initiation of a peripheral IV according to policy statements 3.4 and 3.5. See Appendix A for Peripheral Intravenous Catheter Poster: Site Selection.

4.8 Place the extremity for the venipuncture site on a stable surface below heart level to allow gravity to enhance venous dilation.

4.9 Place a tourniquet above the intended venipuncture site.

4.10 Cleanse the skin by a vigorous scrub at the intended venipuncture insertion site with 2% Chlorhexidine/ 70% Alcohol swab which is the preferred solution. (70% Alcohol may be used when 2% Chlorhexidine/ 70% Alcohol is not available or there is an allergy to Chlorhexidine.) Use repeated back-and-forth strokes for 15 seconds horizontally and 15 seconds vertically. Allow area to dry for 20 seconds.

4.11 Do not touch the skin after cleansing unless a sterile glove is applied.

4.12 **BD Insyte™ Autoguard™ Insertion**

a. Holding the catheter hub, rotate the barrel 360 degrees.
b. Make sure the push tab is facing upwards and the catheter is seated back in the notch.
c. Stabilize the vessel and perform the venipuncture.
d. Look at the catheter for initial blood return
    i. 18 –24 G: in the flash chamber behind the white button
    ii. 16 G: blood return will only be in the flash chamber
e. Once you see blood return, lower the catheter angle and advance the entire catheter and needle unit slightly to ensure the catheter tip and not just the needle tip is within the vessel.
f. While stabilizing the vessel, push the catheter off the needle and into the vessel. Avoid pulling the needle out.
g. Release the tourniquet.
h. Gently stabilize the catheter hub.
i. Push the white button to retract the needle.

j. It is not necessary to occlude the vessel as blood flow will be restricted until a secure luer connection is made opening the septum.
k. Firmly push and turn completely to make a secure connection. With movable spin collar connection, pull the spin collar back, make the connection and then secure the spin collar.
l. Disconnection of the luer requires vessel compression to prevent blood leakage.
m. Secure the IV catheter with a sterile Transparent Semi-Permeable (TSM) dressing. (Do not use non-sterile tape to secure IV)

4.13 **BD Nexiva Closed IV Catheter System Insertion**

a. Open catheter and ensure that the vent plug is securely attached and the clamp is open.
b. Twist and remove the needle cover.
c. Pull back on the white finger grips about 1/8 of an inch.
d. Push the white finger grips back together and ensure a snug fit.
e. Stabilize vessel and perform cannulation.
f. Observe for initial blood return in catheter.
g. Lower the needle and while holding white finger grips, advance the needle and cannula. ~2mm to ensure it is in vein.
h. With your finger behind the push tab, advance the cannula into the vessel (do not pull back on the white finger grips while you are advancing the push tab).
i. Watch for continuous backup of blood to the end of the extension tubing. **Blood must back up all the way to prevent air entry into the system prior to flushing/IV initiation.*
j. Stabilize the IV and pull the white finger grips back until the grey needle shield releases.
k. Dispose needle shield system into sharps container. Although it looks as though you could connect an IV to this port, this is not an injection port. It has a self-sealing diaphragm and does not require anything to be attached.
l. Secure the IV catheter with a sterile Transparent Semi-Permeable Membrane (TSM) dressing. (Do not use non-sterile tape to secure IV).

4.14 Dressing

a. Ensure peripheral IV site is visible at all times.
b. Label dressing with date, time, and initials of initiator of the peripheral IV.

4.15 Document initiation of IV insertion including IV catheter type, peripheral IV site location, needle gauge size, the date and time of the procedure, any complications with insertion, and the patient's response to the IV insertion on the IV Line Assessment in Expanse.

5.0 IV Maintenance Procedure

5.1 Procedure for Routine IV Assessment and Documentation

Routine assessment of the entire infusion system is required at a minimum:	Routine assessment of the entire infusion system must include:
a. If the peripheral IV is saline locked: assess at least once a shift or every 12 hours b. If peripheral IV has a continuous non-vesicant infusion: assess every 4 hours c. If peripherally IV has a vesicant (non-chemotherapy) infusion: assess every 30 minutes d. If patient cannot self-report pain or is critically ill: assess every 1-2 hours for non-vesicant infusion e. For cancer treatment chemotherapy administration see Policy and Procedure for Hazardous Drug Administration	a. Infusion Pump assessment (plugged in or battery power) b. Infusate (correct infusion type, programmed rate, medication expiry date) c. IV administration set (correct tubing, date label on tubing, presence of any leaking) d. IV insertion site assessment for signs of complications (See Appendix B: Visual Infusion Phlebitis Scale): - evidence of dislodgement, redness, tenderness, swelling, infiltration, induration, body temperature elevation, and drainage. - by visual inspection and palpation or patient report of pain, paresthesia, numbness and tingling e. Condition and date of dressing f.

5.2 Procedure for Maintaining IV Patency and Flushing

Flush with 10mL sterile preservative-free prefilled 0.9% sodium chloride syringes using a push-pause flushing method:

a. before and after each IV medication administration when peripheral IV is required for only intermittent IV medication administration
b. every 12 hours if the device is locked and not accessed

5.3 Procedure for Frequency of Change: IV Solution Containers, Administration Sets, Filters, and Accessories

Type	Frequency of Change	Key Points
Label all administration sets/tubing with date and time of initiation and with each change		
Change administration set when: • peripheral IV is changed • accidental disconnection or contamination • break in the integrity of the tubing and accessories/extension		
IV solution bags (with or without medication added)	Every 24 hours	It is recommended that the size of the bag reflect the total fluids ordered for a 24 hour period for the patient
Primary and secondary continuous administration sets other than lipid, blood or blood products	No more frequently than 96 hours	

Blood product tubing	No longer than four hours, or two units.	See details in: Administration of Blood and Blood Components Policy and Procedure
IV primary or secondary administration sets that are used intermittently for medication delivery (syringes or piggy back)	Every 24 hours	Administration sets that may be used for primary or secondary IV infusions must be properly secured from the patient when disconnected
IV administration sets with inline and add on filters for parenteral nutrition (with or without lipids)	Every 24 hours or with each new parenteral nutrition container	
IV administration sets used for injectable lipid emulsions (ILE)	Every 12 hours or with each new container	
Add-ons	Must be attached aseptically. If an add on is required, the entire administration set must be changed.	Any add-on device required to facilitate delivery of the prescribed therapy such as: extension sets, filters, needleless connectors, stopcocks

5.4 Procedure for IV removal:

a. Follow Hand Hygiene and Glove use Policy and Procedure
b. Don non- sterile gloves.
c. Stop IV infusion and clamp the line.
d. Remove any tape and transparent dressing adhering to IV catheter and tubing.
e. Withdraw the IV catheter. A dry sterile gauze should be held over the site while the catheter is being removed.
f. Firm pressure should them be applied until all bleeding is stopped.
g. Apply tape over the gauze or apply a bandage.
h. Instruct the patient to notify a nurse if bleeding is noted from the site.
i. Document reason for removal, date and time of removal, and any necessary continuing management for complications on the IV line Intervention in Expannse

6.0 Definitions:

Aseptic Non Touch Technique ANTT® The aseptic non-touch technique (ANTT®) method of aseptic technique used to prevent microbial contamination of aseptic parts and sites by ensuring that are not touched either directly or indirectly.

There are six core principles which help promote safe ANTT®.

1) Handwashing
2) Correct glove use
3) Using non-touch technique
4) Key part and key site protection
5) Aseptic field management
6) Key part and key site disinfection

Credentialed Staff: Physicians, dentists, midwives or extended class nurses (nurse practitioners) who are appointed by the Halton Healthcare Board of Directors and who are granted specific privileges to practice medicine, dentistry, midwifery or extended class nursing, respectively, in one or more Halton Healthcare hospital sites.

7.0 Related Documents

High Alert Drugs Policy and Procedure
Paediatric and Neonatal High Alert Drug Policy
Electronic Policy and Procedure Information Center (EPPIC)
Policy and Procedure for Hazardous Drug Administration

8.0 Key words

IV, intravenous, peripheral IV, infusion, vascular access, venous access

9.0 References

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10.0 Appendices

Appendix A Peripheral Intravenous Catheter: Site Selection
Appendix B – Visual Infusion Phlebitis Scale

Appendix A: Peripheral Intravenous Catheter: Site Selection Guide

CVAA Online Learning Resources 2015 – Module 2

PERIPHERAL INTRAVENOUS (PIV) CATHETER **POSTER:** SITE SELECTION

GO

FIRST CHOICE (OPTIMAL):

- Dorsal forearm
- Ventral forearm
- Minimum 2 fingers' width from the wrist
- Assess distal sites first

NOTE: Larger veins in the forearm are preferred for infusions that need to be given rapidly. The bones of the ulna and radius act as natural splints at these sites and permit the patient greater freedom of arm movement and ability to participate in activities of daily living (ADLs).

CAUTION

SECOND CHOICE:

- Dorsal portion of hand, avoiding the thumb

THIRD CHOICE:

- Antecubital area – try for 2 fingers' width below or above

NOTE: The antecubital veins are a last choice as these sites are located at points of multiple flexion and extension which increases the risk of phlebitis.

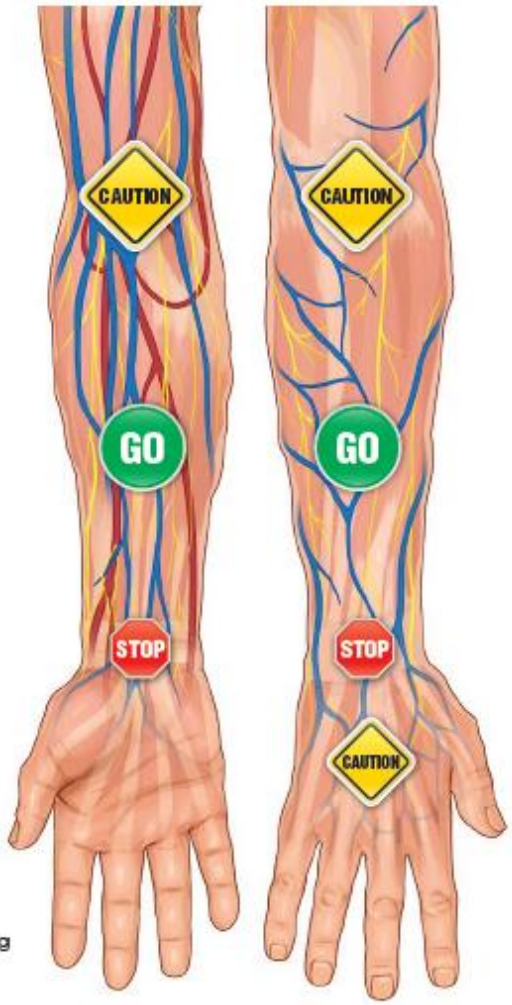
Infusion into these sites makes hourly assessments difficult as the proximal tissue is typically located under clothing, and not readily visible to the caregiver.

In the event that they are used, it is important to remove as soon as possible to prevent further damage to the vessel. Leaving these devices in can cause extreme discomfort to the patient and prevents usage of vessels further down on the arm.

STOP

AVOID USING THE FOLLOWING:

- Sclerotic or highly visible veins since they tend to roll
- Veins in an area of flexion
- Veins damaged by previous use (phlebitis or infiltration)
- Veins that are knotted or tortuous
- Areas of skin inflammation, disease or bruising
- An arm with an AV fistula
- Veins in an extremity that is edematous, compromised or injured



CVAA Canadian Vascular Access Association / Association Canadienne d'Accès Vasculaire

Appendix B: Visual Infusion Phlebitis Scale

Signs on Visual Inspection	Score	Action
IV site appears healthy	0	No signs of phlebitis OBSERVE CANNULA
One of the following is evident: ●Pain ●Erythema ●Swelling	1	Possible first sign of phlebitis MONITOR CANNULA MORE FREQUENTLY
Two of the following are evident: ●Pain ●Erythema ●Swelling	2	Early stage of phlebitis RESITE THE CANNULA
All of the following are evident: ●Pain along the path of the cannula ●Erythema ●Induration	3	Medium stage of phlebitis RESITE THE CANNULA CONSIDER TREATING PHLEBITIS
All of the following signs evident and extensive: ●Pain along the path of the cannula ●Erythema ●Induration ●Palpable venous cord	4	Advanced stage of phlebitis or start of thrombophlebitis RESITE THE CANNULA AND CONSIDER TREATING PHLEBITIS
All of the following signs are evident and extensive: ●Pain along the path of the cannula ●Erythema ●Induration ●Palpable venous cord ●Pyrexia	5	Advanced stage of thrombophlebitis INITIATE TREATMENT FOR THROMBOPHLEBITIS AND RESITE THE CANNULA

From: Moureau, N, L. (Ed.) (2019). Vessel Health and Preservation: The Right Approach for Vascular Access. Springer Open. Page 225